



Building Bridges to Net Zero



# Common Space or Residential Units? One Program's Attempt To Have It All

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TRC Energy Services

# Agenda

- Introduction
- California Multi-Family New Homes Overview
- Process of Including Common Spaces
- Results
- Next Steps



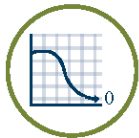
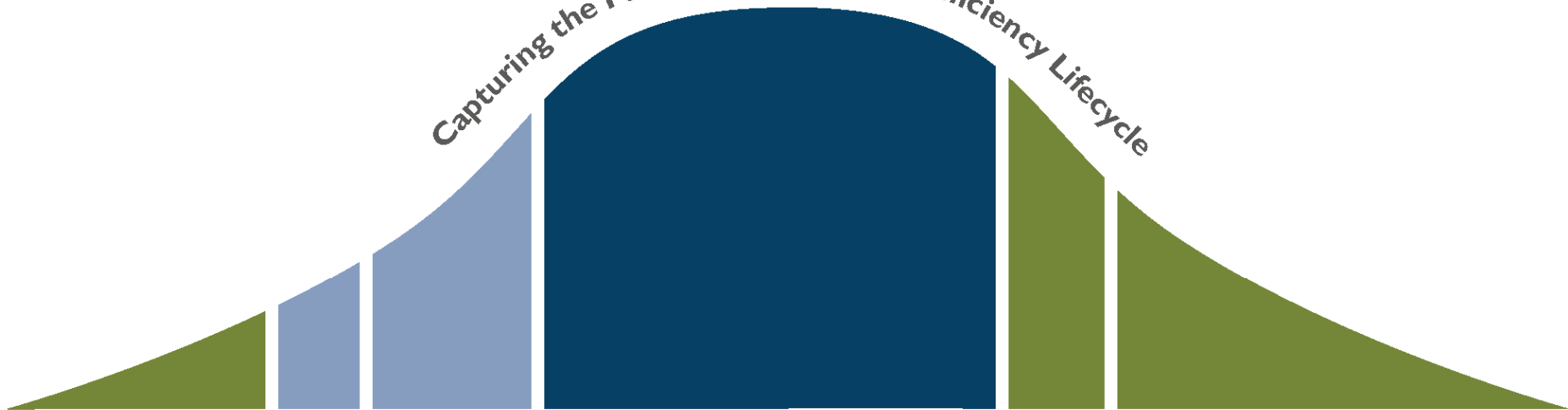
# Program Sponsor



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# TRC Energy Services

Capturing the Full Potential of Your Efficiency Lifecycle



ZNE & Emerging Technologies



Energy Portfolio & Master Planning



Engineering Services



Residential, C&I Programs



Evaluation



Codes & Standards

# CMFNH Overview



CALIFORNIA  
MULTI-FAMILY  
NEW HOMES

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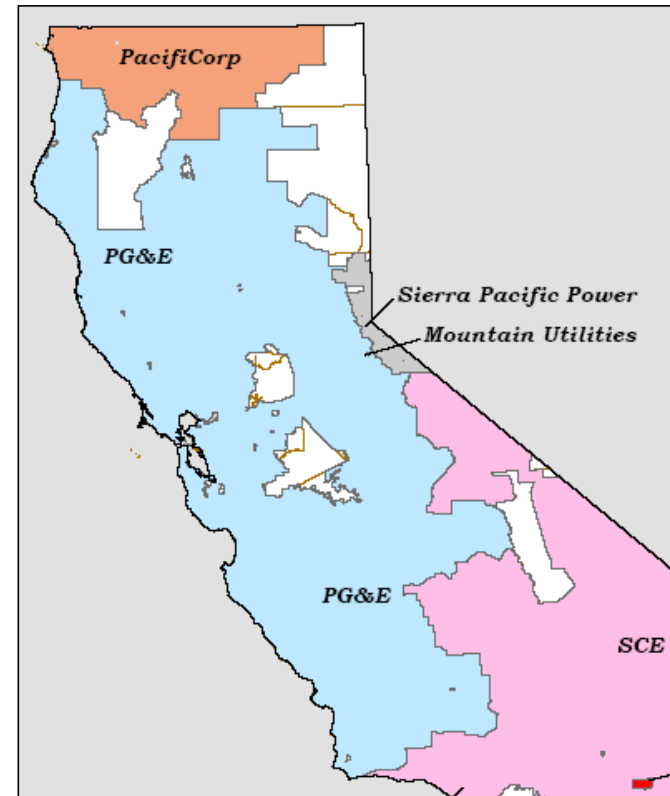
## Public service program

- Cash Incentives
  - Energy Design Assistance
  - Project Roundtable
  - Educational Opportunities
  - Program Coordination
- 
- Facilitate energy efficient design and construction in new multi-family housing through financial incentives and design assistance

# Eligible Customers

## Multi-family buildings in PG&E service territory

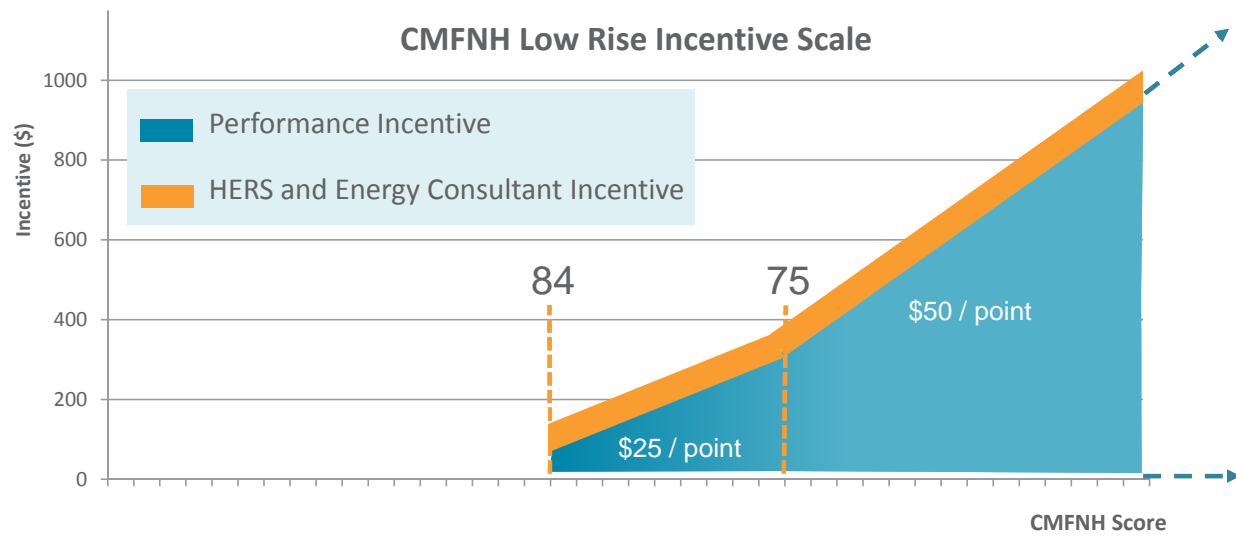
- 3 or more attached units
- New construction
- Exceed 2013 Title 24 Standards by at least 15%
- Complete construction and verification by December 31, 2018
- Example building types: apartments, condos, townhomes



\* Please contact TRC if you are unsure of the eligibility of your project.

# Incentive Information

Incentive (per unit)	Low Rise (1 - 3 stories)	High Rise (4+ stories)
Performance (issued to developer)	<ul style="list-style-type: none"> <li>– \$75 base incentive: Meet 15% better than 2013 standards <b>OR</b> a CMFNH Score of 84</li> <li>– \$25 per CMFNH point down to 75</li> <li>– \$50 per CMFNH point below 75</li> </ul>	<ul style="list-style-type: none"> <li>– \$150 for 15%</li> <li>– \$400 for 30%</li> </ul>
Energy Consultant	– \$50 (200 unit limit)	
HERS (issued to developer)	– \$60 (200 unit limit)	



# Program Obstacles

- CA Title 24 considers multifamily residential and nonresidential
- Program not truly whole building
- Savings from common spaces unaccounted for
- Residential only energy models result in extra work for customers
- Common spaces eligible for commercial new construction program but did not enroll



# What are Common Spaces?



- Hallways (conditioned and unconditioned)
- Lobbies
- Stairwells
- Laundry rooms
- Conference rooms
- Multi-purpose rooms
- Managers office
- Computer room
- Elevators
- Exercise room
- Tenant Lounge
- Storage room
- Mail room
- Common or Shared Kitchen

# Incorporation Process

1. Building Selection
2. Common Space Energy Modeling
3. Post-Modeling Analysis
4. Report and Recommendations
5. PG&E Approval
6. Incorporation into Program

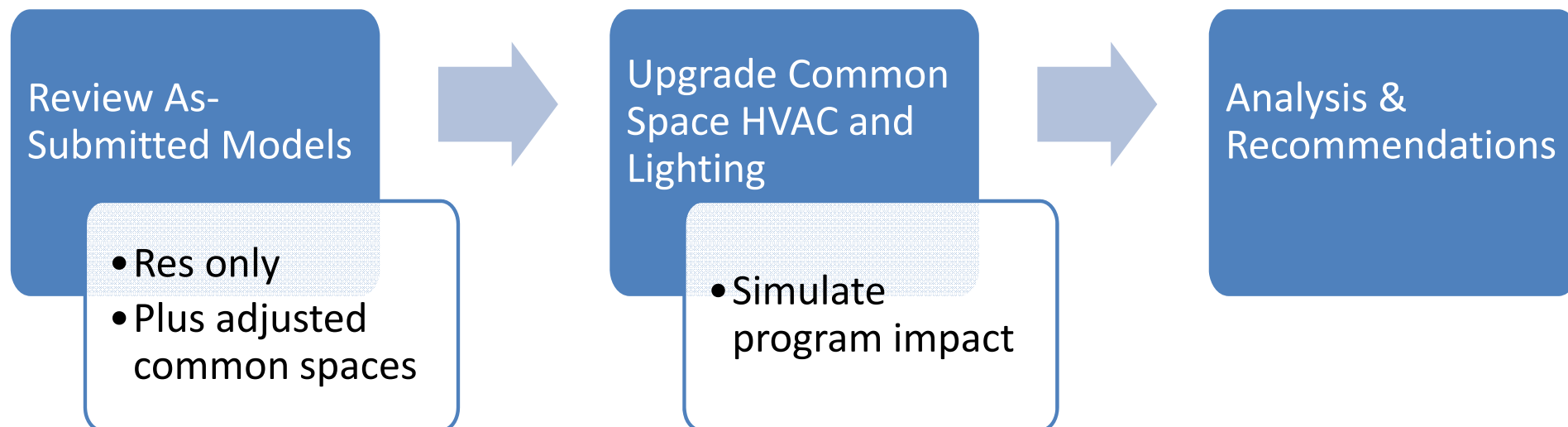


# Building Selection

Project	Building Size (sf)		# Units	Floors	Climate Zone
	Residential	Residential + Common Spaces			
HR-Building 1	45,737	70,164	52	4	San Francisco Bay Area
HR-Building 2	45,144	60,662	64	4	San Francisco Bay Area
HR-Building 3	44,436	62,908	77	4	San Francisco Bay Area
LR-Building 1	171,173	174,700	148	1	Central Valley
LR-Building 2	28,880	52,448	86	2	Central Coast
LR-Building 3	49,038	51,663	44	1	Central Valley
LR-Building 4	85,246	90,863	70	1	Central Coast

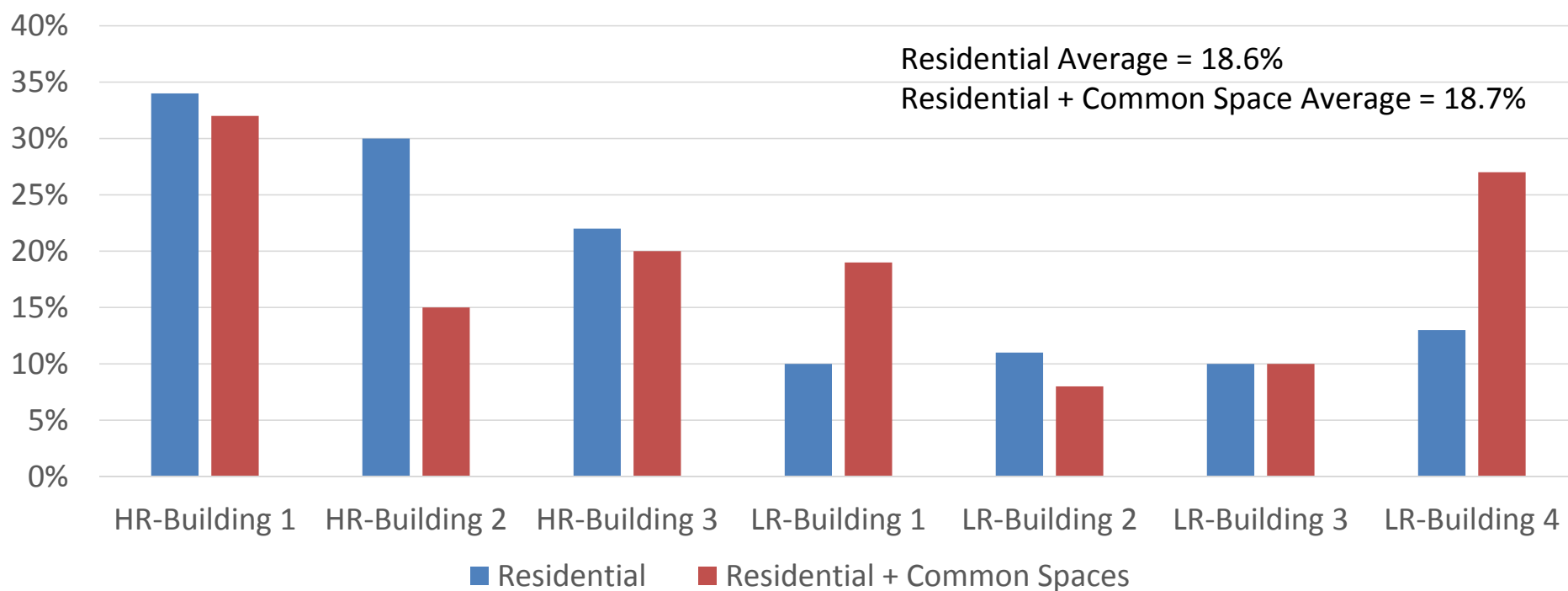


# Energy Modeling & Analysis



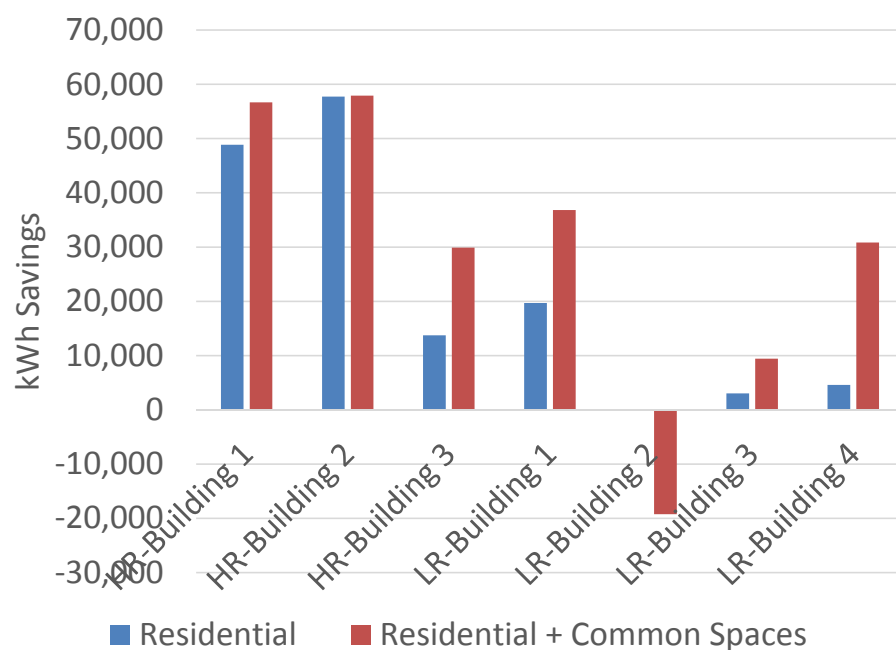
# Common Space Energy Modeling

Percent Above CA Title 24

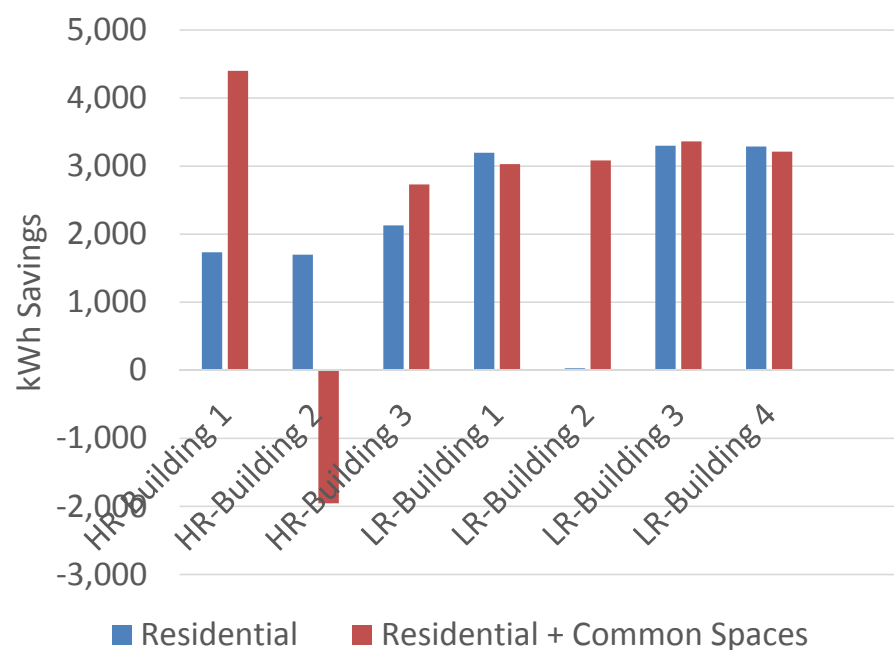


# Common Space Energy Modeling

kWh Savings per Building



Therms Savings per Building



# Energy Modeling Findings

- Unmet HVAC load hours significantly impact building compliance
- Fan modeling parameters can have a large impact on kWh savings
- HR and LR buildings with heat pumps are treated very differently
- Unconditioned corridors can negatively impact energy savings due to software limitations

# Post-Modeling Analysis: Improved Lighting & HVAC

Project	% Improvement over 2013 Title 24		kWh Savings Claimed			Therm Savings Claimed		
	Residential	Residential + Common Spaces	Residential	Residential + Common Spaces	Additional Savings	Residential	Residential + Common Spaces	Additional Savings
HR-Building 1	34%	34%	48,867	64,613	15,746	1,734	4,402	2,668
HR-Building 2	30%	15%	57,738	60,205	2,467	1,699	(1,954)	(3,653)
HR-Building 3	22%	20%	13,727	29,891	16,164	2,129	2,731	602
LR-Building 1	10.7%	19.6%	19,692	36,815	17,123	3,198	3,031	(167)
LR-Building 2	11.8%	8.5%	(222)	(19,216)	(18,994)	29	3,085	3,056
LR-Building 3	10.5%	10.9%	3,035	9,430	6,395	3,301	3,363	62
LR-Building 4	13.6%	27.3%	4,608	30,841	26,233	3,289	3,214	(75)



# Incorporation into Program

- Need to develop incentives
  - Per-unit basis? Common spaces as separate building? Align with CMFNH or SBD incentive levels?
- Revise program eligibility criteria
  - Allow res only exceptions?
- Common space modeling rules needed
  - Heat pump systems
- New plan review and field verification procedures

# Thank you!

Any questions?

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